

WHAT IS CLAIMED IS:

✓ 1. ✓ A method for implanting a heart valve in a patients heart annulus

including:

selecting an anchor device for receipt through said annulus including spaced apart
ring elements shiftable relative to one another from recessed to deployed positions and a retainer
retained between said rings operable upon said rings being shifted from a retainer recessed
position to a retainer deployed position projecting radially outwardly;

accessing an artery of said patient and inserting said anchor device therethrough to
position it in said annulus; and

shifting said rings relative to one another to said deployed position to shift said
retainer to said retainer deployed position.

✓ 2. ✓ The method for implanting a heart valve anchor as set forth in claim 1,

wherein:

said step of selecting said anchor device includes selecting said anchor device to
include a radially outwardly projecting stop ring on the proximal end thereof; and

said steps of inserting said device includes inserting it sufficiently far to position
said stop ring on the proximal side of said annulus.

6. The method for implanting a heart valve anchor as set forth in claim 1,
wherein:
said step of shifting said rings includes shifting them axially relative to one
another.

7. The method for implanting a heart valve anchor as set forth in claim 1,
wherein:

having a semi-rigid tubular tool housing and an elongated deployment rod projecting therethrough and coupling the distal end of said tool housing with one of said rings and the distal extremity of the other ring with the other of said rings.

8. An implantable anchor device for anchoring in an annulus and comprising:
first and second ring elements for receipt in said annulus, said rings spaced apart
with one shiftable from a retracted to a deployed position; and
a retainer device interposed between said rings and operable upon said one ring
being shifted to said deployed position to project radially outwardly to engage under the shelf of
said annulus.

9. An anchor device as set forth in claim 8, wherein:
said first ring element includes a stop in said predetermined path to limit movement of said second ring element.

✓ 10. An anchor device as set forth in claim 8, wherein:
a coupler is coupled between said rings for coupling said rings together for
shifting relative to one another from a retracted position to said deployed position

11. An anchor device as set forth in claim 8, wherein:
said ring elements are shiftable axially relative to one another] and
said retainer includes a plurality of flexible axial strips configured to, when said
one ring element is in said retracted position, assume respective axially projecting positions and
to, when said one ring element is shifted to said deployed position, flex radially outwardly.

12. An anchor device as set forth in claim 11, wherein:
said device includes said strips being configured to, when said one ring element is
shifted to said deployed position, flex radially outwardly.

13. An anchor device as set forth in claim 8, wherein:
said coupler includes screw threads.

✓ 14. ✓ An anchor device as set forth in claim 8, wherein:
said ring elements are concentric with one another.

✓ 15. ✓ An anchor device as set forth in claim 8, wherein:

said ring elements are flared to project radially outwardly at their proximal extremities.

Group II 16. An anchor device as set forth in claim 8 that includes:

a driver mounted on one of said rings and operative upon shifting of said one ring to said deployed position to drive said retainer to its deployed position.

✓ 17. An anchor device as set forth in claim 8 that includes:

an elongated band configured to form said first and second ring elements on the proximal and distal extremities thereof, said distal extremity being configured to, upon said proximal and distal extremities being shifted axially towards one another, project radially outwardly to form said retainer.

18. An anchor device as set forth in claim 17 wherein:

said band is constructed of material having a memory.

11 19. An anchor device as set forth in claim 17 wherein:
said band is constructed of a resilient material and is configured so that, upon said proximal and distal extremities being drawn toward one another, will take a set with said distal extremity disposed radially outwardly to act as said retainer.

11 20. An anchor device as set forth in claim 17 that includes:
a first latch element mounted on said proximal extremity and a second latch element mounted on such distal extremity, said latch elements being configured to, upon said proximal and distal ring elements being drawn a predetermined distance toward one another, extend said distal extremity outwardly to said retaining position to latch together.

11 21. An anchor device as set forth in claim 20 wherein:
said first latch element includes a passage formed therein; and
said second latch element includes an axially elongated tab cantileverally mounted on said distal extremity and projecting toward said latch and further constructed of spring material and having at least one distal tooth configured to flex laterally as it engages said latch and to, upon said first and second ring elements being shifted to said deployed position, engage behind said latch.

22. An anchor device as set forth in claim 17 wherein:
said band includes a weakening strip interposed therebetween for enhancing
bending thereof.

✓ 23. ✓ An anchoring device as set forth in claim 8 wherein:
said ring elements are in the form of elongated concentric rings rotatable relative
to one another to deploy said retainer;

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said one ring element includes an inner ring and an outer ring, said outer ring
including a plurality of retainer windows; and

10 said retainer includes a plurality of resilient fingers cantileverally mounted on said
inner ring and registered on their free extremities with said windows, said retainer fingers being
configured such that rotation in one direction of said inner ring relative to said outer ring, the
distal extremities of said retainer fingers will project through said windows and be directed
radially outwardly to a retaining position.

✓ 24. ✓ An anchoring device as set forth in claim 23 wherein:
said outer ring is formed with said windows positioned relative to said retainer
fingers such that, upon continued rotation of said outer ring relative to said inner ring beyond
said deployed position, said retainer fingers will be retracted radially inwardly from said retained
position.

✓ 25. A heart valve anchor device for anchoring a valve in a heart annulus of a patient comprising:

an elongated ring device including a ring housing configured on its proximal extremity with a laterally outwardly flared stop ring to nest against the proximal side of said annulus; and

a plurality of movable retainers carried by said ring device to project laterally outwardly to respective retaining positions from the distal extremity thereof.

✓ 26. A heart valve anchor device as set forth in claim 25, wherein:
said retainers are resilient.

✓ 27. A heart valve anchor device as set forth in claim 25, that further includes:
a retractor for retracting said retainers laterally inwardly from said retaining positions.

28. A heart valve deployment tool for deploying a prosthetic heart valve having first and second anchor ring elements shiftable relative to one another for deploying a retainer to anchor a heart annulus and comprising:

an elongated housing tube including on its distal extremity a plurality of
5 outwardly diverging legs configured on their respective distal extremities with first engaging
elements for engaging said first ring element;

an actuator received in said tube and formed on its distal extremity with outwardly
diverging tines configured on their respective distal extremities with second engaging elements
for engaging said second ring element; and

10 a handle mounted on the proximal extremity of said actuator to be grasped to shift
said actuator relative to said housing tube to shift said tines relative to said legs to shift said
second ring element relative to said first ring element to deploy said retainer.

29. A deployment tool as set forth in claim 28 that includes:

latches mounted on the distal extremities of said legs and shiftable between a
latching position engaging said second ring element and a retracted position;

a latch release handle mounted on the proximal end of said housing tube and
5 shiftable relative thereto; and

a wire connected between said latch handle and said latches.

30. A deployment tool as set forth in claim 29 wherein:

said housing tube includes at least one longitudinal slot adjacent said latch handle;

and

said wire device projects through said slot.

31. A deployment tool as set forth in claim 29 wherein:
said latches are in the form of claws pivotally mounted to said legs.

32. A deployment tool as set forth in claim 28 wherein:
said actuator is rotatable relative to said tube for rotating said tines relative to said
leg.

33. A deployment tool as set forth in claim 28 wherein:
said actuator is shiftable longitudinally relative to said tube for shifting said tines
longitudinally relative to said legs.

34. A deployment tool as set forth in claim 28 for use with a prosthetic heart
valve having an elongated anchor band having proximal and distal ends shiftable relative to one
another for deployment of said retainer and wherein:
said legs include hooks for projecting longitudinally through said band to hook on
the distal extremity thereof; and
said tines include pushers on the distal end thereof for engaging the proximal
extremity of said band.

35.

A heart valve deployment tool as set forth in claim 28 wherein:

said tines are flexible and slope outwardly and distally and said tool includes a retractor cone mounted on the distal extremity of said tube and configured to, upon retraction of said tines into said cone, engage said tines and flex them radially inwardly; and

5 said housing tube is configured so said actuator is longitudinally telescoped therein to retract said tines into said cone.

36.

An anchor for receiving a prosthetic heart valve to anchor it to an annulus and comprising:

a circular ring housing;

a plurality of retainers movably carried from said housing and moveable from a retracted position to a deployed position to project on their respective one extremities radially outwardly therefrom; and

an actuator mounted from said housing and engaged with said retainers, said actuator being moveable relative to said housing ring to shift said retainers from said retracted to said deployed positions.

37.

An anchor for receiving a prosthetic heart valve as set forth in claim 36 wherein:

said retainers are resilient.

✓ 38. An anchor for receiving a prosthetic heart valve as set forth in claim 37

wherein:

said retainers are in the form of elongated springs mounted on their respective one ends to said housing and configured with respective free extremities forming the respective said one extremities.

✓ 39. An anchor for receiving a prosthetic heart valve as set forth in claim 36

wherein:

said retainers are generally U-shaped.

✓ 40. An anchor for receiving a prosthetic heart valve as set forth in claim 36

wherein:

said actuator includes an actuator ring coupled to said housing ring.

✓ 41. An anchor for receiving a prosthetic heart valve as set forth in claim 36

that includes:

a coupler coupling said actuator to said housing for guided travel of said actuator through a predetermined path and wherein:

said housing includes a stop disposed in said path to limit travel of said actuator.

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42. A method of implanting a heart occluder anchor in an annulus including:
selecting a heart valve anchor for receipt in said annulus and of the type including extendable retainers for selectively engaging said annulus and an occluder connector for connection with said occluder; and

selecting an intraluminal implant tool, coupling it with said ring, advancing said anchor ring intralumenally to said annulus and deploying said retainers to engage said annulus.

43. The method as set forth in claim 42 that includes:
selecting an occluder including a connector for removable connection with said first mentioned connector, introducing it intralumenally to said annulus and connecting it to said first mentioned connector.

44. The method as set forth in claim 42 that includes:
selecting said anchor ring of the type having said connector in the form of a bayonet style connector.

45. The method as set forth in claim 42 that includes:
selecting said anchor ring of the type having said connector in the form of a rotary engageable and disengageable connector.

R 46. The method as set forth in claim 43 that includes:

reaccessing said annulus, removing said occluder, introducing a second occluder and connecting it to said first mentioned connector.

✓ II R 47. A heart valve anchor device for implant in a heart annulus including:
an anchor ring for receipt in said annulus;
a retainer device on said ring for selective extension into holding contact with the wall of said annulus;

→ is the shape memory of the material.
an actuator on said ring for extending said retainer device; and
an occluder connector device on said ring for removably mounting an occluder.

✓ 48. The heart valve anchor device as forth in claim 47, wherein:
said occluder mounting device includes a rotary connector.

49. The heart valve anchor device as set forth in claim 47, wherein:
said occluder mounting device includes a bayonet thread.

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